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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
ROE, JESSEE RANDALL				
ART UNIT		PAPER NUMBER		
1793				
NOTIFICATION DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/593,338

Applicant(s)

ODA ET AL.

Examiner

JESSEE ROE

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5, 7-9, 14, 18, 21-22 and 25-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5, 7-9, 14, 18, 21-22 and 25-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-506)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ ~~Notice of Informal Patent Application~~
- 6) ☐ Other: _____

DETAILED ACTION

Status of the Claims

Claims 5, 7-9, 14, 18, 21-22 and 25-35 are pending wherein claims 5 and 7-9 are amended, claims 31-35 are new, and claims 1-4, 6, 10-13, 15-17, 19-20 and 23-24 are canceled.

Status of Previous Rejections

The previous rejection of claims 5, 7-8, 21, 25 and 27-29 under 35 U.S.C. 103(a) as being unpatentable over Mulder (US 5,066,323) is withdrawn in view of the Applicant's amendments to claims 5 and 7-8.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 9, 22, 26 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulder (US 5,066,323) in view of the ASM Handbook Volume 2 (page 55, cols. 2-3).

In regards to claim 9, Mulder ('323) discloses aluminum alloys having compositions relative to that of the instant invention as shown in the table on the following page (col. 2, lines 17-27 and col. 2, lines 34 – 48).

Element	From Instant Claims (mass percent)	Mulder ('323) (mass percent)	Overlap
Si	13 – 25	11 – 30 (16 – 26)	13 – 25 (16 – 25)
Cu	2 – 8	0 – 6	2 – 6
Fe	0.5 – 3	0 – 3	0.5 – 3
Mn	1 – 3	0 – 1	1
P	0.001 – 0.02	0.002 – 0.05	0.002 – 0.02
Ni	0.5 – 6	0 – 3	0.5 – 3
Cr	0.1 – 1	0 – 1	0.1 – 1
Al	Balance	Balance	Balance

The Examiner notes that the aluminum alloy composition disclosed by Mulder ('323) overlaps the composition of the instant invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed amounts of silicon, copper, iron, manganese, phosphorus, nickel and chromium for an aluminum alloy from the amounts disclosed by Mulder ('323) because Mulder ('323) discloses the same utility throughout the disclosed ranges.

Still regarding claim 9, Mulder ('323) teaches that structural refinement is an important feature in aluminum alloys, but Mulder ('323) does not specify the presence of titanium in the alloy.

The ASM Handbook Volume 2 teaches that the addition of 10 ppm to 100 ppm (0.001 to 0.01 mass percent titanium) with boron in the form of soluble TiB_2 would provide an enhanced grain refining effect (page 55, cols. 2-3).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add 10 ppm to 100 ppm (0.001 to 0.01 mass percent titanium) with boron in the form of soluble TiB_2 , as disclosed by the ASM Handbook

Volume 2, to the aluminum alloy, as disclosed by Mulder ('323), in order to provide an enhanced grain refining effect, as disclosed by the ASM Handbook Volume 2 (page 55, cols. 2-3).

With respect to the recitation "wherein the amount of nickel is 1-6% by mass" in claim 22, Mulder ('323) discloses 0 to 3 mass percent nickel, which overlaps the instantly claimed range of 1 to 6 mass percent (col. 2, lines 17-27 and col. 2, lines 34 – 48).

With respect to the recitation "wherein the amount of nickel is 3-6% by mass" in claim 26, Mulder ('323) discloses 0 to 3 mass percent nickel, which overlaps the instantly claimed range of 3 to 6 mass percent (col. 2, lines 17-27 and col. 2, lines 34 – 48).

With respect to the recitation "said aluminum alloy has a Young's modulus of 92 GPa or more" in claim 30, the Examiner notes that the composition disclosed by Mulder ('323) would be the same or substantially similar to that of the instant invention. Therefore, this property would be expected. MPEP 2112.01 I.

With respect to the recitation "wherein the total amount of iron and manganese is 3.0% by mass or greater" as in lines 6-9 of claim 9, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D. 357, 553 O.G. 177., 57 USPQ 117, *Sakalattwalla v. Marburg*, 620 O.G. 685, 1949 C.D. 77, and *In re Pilling*, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In the absence of evidence to the contrary, the selection of the proportions of iron and manganese would appear to require no more than routine

investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685,688. It would have been obvious to one of ordinary skill in the art to select the claimed ranges of iron and manganese from the aluminum alloys disclosed by Mulder ('323) because Mulder ('323) teaches the same utility throughout the disclosed ranges.

Claims 5, 7-9, 14, 18, 21-22 and 25-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lawrence et al. (US 3,325,279).

In regards to claim 5, 7-9 and 31-35, Lawrence et al. ('279) discloses an aluminum-silicon alloy having about 26 to 45 mass percent, less than about 0.005 mass percent phosphorus and "not more than 10 percent by mass of a modifying metal addition selected from the group consisting of magnesium, copper, manganese, nickel, chromium, titanium, iron, and compatible combinations thereof" (col. 1, lines 35-46 and col. 1, line 64 – col. 2, line 19).

Still regarding claim 5, the Examiner notes that the sum of the claimed contents of copper, iron, manganese, and nickel is a range of 4.5 to 20 mass percent and therefore "not more than 10 percent by mass of a modifying metal addition selected from the group consisting of magnesium, copper, manganese, nickel, chromium, titanium, iron, and compatible combinations thereof" as disclosed by Lawrence et al. ('279) would overlap in scope with the instant invention (claims 1, 6 and 7).

The Examiner notes that the aluminum alloy composition disclosed by Lawrence et al. ('279) overlaps the composition of the instant invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of

ordinary skill in the art at the time the invention was made to select the claimed amounts of silicon, phosphorus, copper, manganese, nickel, chromium, titanium, and iron for an aluminum alloy from the amounts disclosed by Lawrence et al. ('279) because Lawrence et al. ('279) discloses the same utility throughout the disclosed ranges.

With respect to the amended recitation "wherein the total amount of iron and manganese is 3.0% by mass or greater" as in lines 4-5 of claim 5, lines 7-8 of claim 7, line 5 of claim 8, and lines 6-7 of claim 9, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art. In re Cooper and Foley 1943 C.D. 357, 553 O.G. 177., 57 USPQ 117, Sakalatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In the absence of evidence to the contrary, the selection of the proportions of iron and manganese would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the claimed ranges of iron and manganese from the aluminum alloys disclosed by Lawrence et al. ('279) because Lawrence et al. ('279) teaches the same utility throughout the disclosed ranges.

With respect to the recitation "said aluminum alloy having a Young's modulus of 90 GPa or more and a coefficient of linear thermal expansion of $18 \times 10^{-6}/^{\circ}\text{C}$ or less" as recited in lines 5-8 of claim 5, lines 8-9 of claim 7, lines 5-8 of claim 8, and lines 7-9 of claim 9, the Examiner notes that the composition disclosed by Lawrence et al. ('279) would be the same or substantially similar to that of the instant invention. Therefore,

these properties would be expected. MPEP 2112.01 I.

With respect to the amended recitations "wherein the amount of manganese is 1.2-3% by mass" in lines 2-3 of claim 5, lines 2-3 of claim 7, lines 2-3 of claim 8, "wherein the amount of manganese is 1.2-3% by mass and the amount of nickel is 1-6% by mass" in claim 18, "wherein the amount of nickel is 1-6% by mass" in claims 21-22, and "wherein the amount of nickel is 3-6% by mass" in claims 25-26", Lawrence et al. ('279) discloses not more than 10 mass percent of manganese and nickel (claims 1, 6 and 7).

With respect to the recitation "said aluminum alloy has a Young's modulus of 92 GPa or more" in claims 27-30, the Examiner notes that the composition disclosed by Lawrence et al. ('279) would be the same or substantially similar to that of the instant invention. Therefore, this property would be expected. MPEP 2112.01 I.

Claims 5, 7, 27-28 and 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kami et al. (JP 03-199336).

In regards to claim 5, Kami et al. (JP '336) discloses aluminum alloys having compositions relative to that of the instant invention as shown in the table below (page 2, claim 2).

Element	From Instant Claims (mass percent)	Kami et al. (JP '336) (mass percent)	Overlap
Si	13 – 25	13 – 18	13 - 18
Cu	2 – 8	1 – 7	2 – 7
Fe	0.5 – 3	0 – 1.5	0.5 – 1.5
Mn	1.2 – 3	0.2 – 1.5	1.2 – 1.5
P	0.001 – 0.02	0.001 – 0.2	0.001 – 0.02
Ni	1 – 6	3 – 7	3 – 6
Al	Balance	Balance	Balance

The Examiner notes that the aluminum alloy composition disclosed by Kami et al. (JP '336) overlaps the composition of the instant invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed amounts of silicon, copper, iron, manganese, phosphorus, and nickel for an aluminum alloy from the amounts disclosed by Kami et al. (JP '336) because Kami et al. (JP '336) discloses the same utility throughout the disclosed ranges.

With respect to the amended recitation "wherein the total amount of iron and manganese is 3.0% by mass or greater" as in lines 4-5 of claim 5, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943 C.D. 357, 553 O.G. 177., 57 USPQ 117, Saklatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In the absence of evidence to the contrary, the selection of the proportions of iron and manganese would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the claimed ranges of iron and manganese from the aluminum alloys disclosed by Kami et al. (JP '336) because Kami et al. (JP '336) teaches the same utility throughout the disclosed ranges.

With respect to the recitation "said aluminum alloy having a Young's modulus of 90 GPa or more and a coefficient of linear thermal expansion of $18 \times 10^{-6} / ^\circ\text{C}$ or less" as

recited in lines 5-8 of claim 5, the Examiner notes that the composition disclosed by Kami et al. (JP '336) would be the same or substantially similar to that of the instant invention. Therefore, these properties would be expected. MPEP 2112.01 I.

With respect to the recitation "said aluminum alloy has a Young's modulus of 92 GPa or more" in claim 27, the Examiner notes that the composition disclosed by Kami et al. (JP '336) would be the same or substantially similar to that of the instant invention. Therefore, this property would be expected. MPEP 2112.01 I.

In regards to claim 7, Kami et al. (JP '336) discloses aluminum alloys having compositions relative to that of the instant invention as shown in the table below (page 2, claim 2).

Element	From Instant Claims (mass percent)	Kami et al. (JP '336) (mass percent)	Overlap
Si	13 – 25	13 – 18	13 – 18
Cu	2 – 8	1 – 7	2 – 7
Fe	0.5 – 3	0 – 1.5	0.5 – 1.5
Mn	1.2 – 3	0.2 – 1.5	1.2 – 1.5
P	0.001 – 0.02	0.001 – 0.2	0.001 – 0.02
Ni	1 – 6	3 – 7	3 – 6
Ti	0.01 – 1	0.001 – 0.3	0.01 – 0.3
Al	Balance	Balance	Balance

The Examiner notes that the aluminum alloy composition disclosed by Kami et al. (JP '336) overlaps the composition of the instant invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed amounts of silicon, copper, iron, manganese, phosphorus, nickel and titanium for an aluminum alloy from the amounts disclosed by Kami et al. (JP '336) because Kami et al. (JP '336)

discloses the same utility throughout the disclosed ranges.

With respect to the amended recitation "wherein the total amount of iron and manganese is 3.0% by mass or greater" as in lines 7-8 of claim 7, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art. In re Cooper and Foley 1943 C.D. 357, 553 O.G. 177., 57 USPQ 117, Sakalatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In the absence of evidence to the contrary, the selection of the proportions of iron and manganese would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the claimed ranges of iron and manganese from the aluminum alloys disclosed by Kami et al. (JP '336) because Kami et al. (JP '336) teaches the same utility throughout the disclosed ranges.

With respect to the recitation "said aluminum alloy having a Young's modulus of 90 GPa or more and a coefficient of linear thermal expansion of $18 \times 10^{-6}/^{\circ}\text{C}$ or less" as recited in lines 8-9 of claim 7, the Examiner notes that the composition disclosed by Kami et al. (JP '336) would be the same or substantially similar to that of the instant invention. Therefore, these properties would be expected. MPEP 2112.01 I.

With respect to the recitation "wherein the amount of nickel is 3-6% by mass" in claim 24, Kami et al. (JP '336) discloses 3 to 7 mass percent nickel, which encompasses the instantly claimed range of 3 to 6 mass percent (page 2, claim 2).

With respect to the recitation "said aluminum alloy has a Young's modulus of

92 GPa or more" in claim 28, the Examiner notes that the composition disclosed by Kami et al. (JP '336) would be the same or substantially similar to that of the instant invention. Therefore, this property would be expected. MPEP 2112.01 I.

With respect to the recitation "wherein the total amount of iron and manganese is 3.7% by mass or greater" in claims 34-35, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943 C.D. 357, 553 O.G. 177., 57 USPQ 117, Sakalattwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In the absence of evidence to the contrary, the selection of the proportions of iron and manganese would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the claimed ranges of iron and manganese from the aluminum alloys disclosed by Kami et al. (JP '336) because Kami et al. (JP '336) teaches the same utility throughout the disclosed ranges.

Response to Arguments

Applicant's arguments filed 7 April 2010 have been fully considered but they are not persuasive.

First, the Applicant primarily argues that the cited prior art is silent about any combined grain refining effect of titanium and hexafluorophosphates and there is no motivation to combine the ASM's Ti with Mulder's aluminum-silicon alloy to enhance

grain refining. The Applicant further argues that if enhanced grain refining is desired, the skilled artisan would be motivated to use Mulder's hexafluorophosphates in Mulder's aluminum-silicon alloy and there is no reasonable expectation that the skilled artisan would have combined ASM with Mulder to reach "0.01-1.0% by mass of titanium" in Mulder's aluminum-silicon alloy.

In response, the Examiner notes that although Mulder ('323) (col. 1, lines 63-65) teaches that hexafluorophosphates provide some or "good" grain refinement, one skilled in the art knows that enhanced grain refinement is provided by the addition of titanium boride based upon the teachings of the ASM Handbook Volume 2 (page 55, cols. 2-3). The addition of the titanium boride to aluminum alloys, as disclosed by the ASM Handbook Volume 2, does not exclude aluminum alloys containing phosphorus or hexafluorophosphates. Therefore, Applicant's arguments are not persuasive.

Second, the Applicant primarily argues that Lawrence et al. ('279) fails to suggest the limitation of independent claims 5 and 7-9 since the claimed range of silicon is 13 to 25 mass percent and Lawrence et al. ('279) discloses aluminum alloys containing 26 to 45 mass percent silicon.

In response, the Examiner notes that Lawrence et al. ('279) teaches that the alloy of the invention contains from about 26 to 45 mass percent silicon (col. 1, lines 47-57 and claim 1) and "about 26 to 45 mass percent silicon" overlaps in scope with the range of 13 to 25 mass percent silicon.

Third, the Applicant primarily argues that Kami et al. (JP '336) discloses an aluminum alloy containing 0.2 to 1.5 mass percent of manganese and 1.5 mass

percent or less iron; Kami et al. (JP '336) teaches that castability and toughness are impaired when the content of manganese exceeds 1.5 mass percent; and that it is necessary to limit the content of iron to 1.5 mass percent to avoid pronounced loss of ductility and hard spots. Therefore Kami et al. (JP '336) teaches away from the limitation of independent claims 5 and 7 "the total amount of iron and manganese is 3.0% by mass or greater", in order to prevent castability, toughness and ductility from being impaired.

In response, the Examiner notes that the teachings in Kami et al. (JP '336) wherein the alloy would contain 0.2 to 1.5 mass percent of manganese and 1.5 mass percent or less iron indicates that there would be an overlap with the instant invention at 3.0 mass percent of iron plus manganese. Therefore, Kami et al. (JP '336) does not teach away from the instant invention.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jesse Roe whose telephone number is (571) 272-5938. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Roy King/
Supervisory Patent Examiner, Art
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/JR/

